

Durham Research Online

Deposited in DRO:

06 March 2012

Version of attached file:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Beckmann, N. and Minbashian, A. and Wood, R.E. (2011) 'Integrating the study of within- and between-person variability in personality at work.', in Personality and individual differences : theory, assessment and application. New York: Nova.

Further information on publisher's website:

https://www.novapublishers.com/catalog/product_info.php?products_id=19269

Publisher's copyright statement:

Additional information:

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full DRO policy](#) for further details.

INTEGRATING THE STUDY OF WITHIN- AND BETWEEN- PERSON VARIABILITY IN PERSONALITY AT WORK

Nadin Beckmann*, Amirali Minbashian

Accelerated Learning Laboratory, University of New South Wales,
Sydney, NSW 2050, Australia

Robert E. Wood

Melbourne Business School, Carlton, VIC 3053, Australia

ABSTRACT

Research on personality in the workplace has primarily focussed on differences between individuals in their typical thoughts, feelings and behaviours as represented in the five-factor model of personality (McCrae & Costa, 1999). We argue that a within-person conceptualisation of personality offers additional meaningful insights into the role of personality in general and at work in particular. In this chapter we present a multi-level framework that integrates between- and within-person approaches to the study of personality in the workplace. We outline questions of interest that arise within this approach, provide examples from the literature that illustrate each question and highlight future research directions.

Keywords: Five-factor model, Experience sampling, Organisational psychology, Personality, Within-person variability

INTRODUCTION

An important but largely unresearched topic in personality research within organisational contexts relates to the variability in personality responses that occurs within a person across time and situations. Although much research has focussed on personality in the workplace, this work has primarily focussed on differences between individuals in their typical thoughts, feelings and behaviours as represented in the five-factor model of personality (McCrae & Costa, 1999), and the relation of these to work outcomes of interest (e.g., Barrick, Mount & Judge, 2001). In trait models, such as the five-factor model, which study

* Ph: 61-2-9931 9187; Fax: 61-2-9931 9199; nadin.beckmann@unsw.edu.au

between-person effects, variability that occurs within a person is treated as error variance. In this chapter we will present a multi-level framework that integrates between- and within-person approaches to the study of personality in the workplace. We will outline some questions of interest that arise within this approach, provide examples from the literature that illustrate each question and highlight future research directions.

BACKGROUND TO AN INTEGRATED APPROACH

Over the past twenty years, the study of personality in organisational psychology has been dominated by traits; that is, relatively stable personality characteristics that influence thoughts, feelings, and overt behaviour (e.g., McCrae & Costa, 1999). The most widely-validated trait model—the five-factor model (FFM; Costa & McCrae, 1992)—describes personality in terms of five broad dimensions labelled neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The trait approach as represented by the FFM has provided a useful framework for organisational psychologists to describe individual differences on fundamental personality characteristics. In particular, it has allowed us to identify which of these between-person differences in personality are relevant for work. For example, meta-analytic studies have shown that individuals who tend to be more conscientious and/or less neurotic tend to perform better across a wide range of occupations (Barrick et al., 2001). Furthermore, by providing a taxonomy of the major personality factors the FFM has enabled the integration of seemingly heterogeneous findings regarding the role of personality in work settings (e.g., Barrick & Mount, 2005; Borkenau, Egloff, Eid, Henning, Kersting, Neubauer & Spinath, 2005).

Although the trait approach has yielded major contributions to the development of personality research in organisational psychology, its emphasis has primarily been on descriptions of people relative to each other on relatively stable characteristics. Less emphasis has been placed on within-person variation, which itself is an important topic within the field of personality (Cervone, 2004). Within-person variability was most prominently studied by Mischel (1973) in the 1970's who argued that a considerable amount of variation in cognition, affect, and behaviour occurs within an individual and that this variation can be explained by the impact of the situation. In response, over the past two decades personality research has adopted a model that includes both trait-concepts and situations as sources of variability (see Matthews & Deary, 1998). This has been referred to as an interactionist approach. Within this approach within-person variability is captured by the concept of 'states'. In contrast to traits, states are conceptualised as aspects of personality that are variable across situations and time. Specifically, traits interact with the situation to influence an individual's state at a given point in time. However, within organisational contexts, the emphasis has been on between-person differences, even when an interactionist approach has been adopted. For example, when predicting job performance using conscientiousness as a predictor, Barrick and Mount (1993) took into account the influence of the situation by including job autonomy as the situational moderator. That is, they examined how individuals who are working under different levels of autonomy compare on their job performance; not how an individual's job performance varies across situations with different levels of autonomy.

Figure 1 illustrates the difference between the two types of variability (i.e., between- versus within-person) discussed above. The figure plots the mean levels and variation in effort expended by two employees (rated on a scale of 0 to 10) conditional on one situational characteristic, namely who is present. Within-person variability in effort across different situations is represented by the profiles (solid lines), whereas between-person variability is represented by the differences between the mean effort levels (dashed lines).

Integrating within-person variability into the study of personality at work is important because of at least three reasons: (1) Previous research within the general personality literature has shown that within-person variability comprises a large part of the total variability in behaviour (Fleeson, 2001). Consequently, in order to get a complete picture of personality at work the two sources of variance (within-person and between-person) need to be simultaneously taken into account; (2) Within-person effects often differ between people and these differences capture meaningful components of personality.

For example, it has been argued that situation contingent within-person effects may provide insights into individual differences in adaptability (Fleeson & Jolley, 2006). Assessing these differences and their correlates will provide insights into aspects of personality that are not well captured by a purely between-person trait approach; (3) Between-person relations are often used as proxies for inferences that relate to within-person effects. Specifically, researchers often articulate theories about the psychological processes that occur within an individual, but then collect data to test these theories at the between-person level. However, the two levels are conceptually and statistically distinct, and, therefore, conclusions that are made at one level do not necessarily generalise to the other level (Nezlek, 2001).

In recent years the study of within-person variability has been advanced by developments in methodological and data-analytic techniques. These techniques facilitate the collection and analysis of data that involves frequent reassessments of individuals and has a multilevel structure. Specifically, *experience sampling methodology* (ESM), while known for several decades, has now become a practical option for collecting large-scale within-person data due to advances in computer technology such as the advent of handheld computers (see Feldman-Barrett & Barrett, 2001); additionally, developments in hierarchical linear modelling and associated software provide a means by which researchers can appropriately address the nested structure of such data (see Raudenbush & Bryk, 2002). We discuss experience sampling and hierarchical linear modelling in greater detail below.

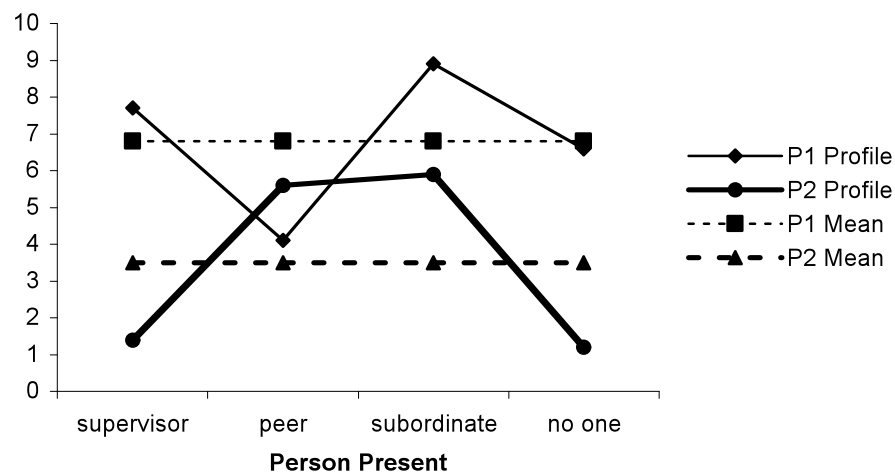


Figure 1. Response patterns for effort levels of two individuals (P1 & P2) as a function of people present in the situation for: (a) the average level of effort across situations (dashed lines), & (b) the variation in effort across situations where different people are present (solid lines).

Experience Sampling Method (ESM)

To study the within-person aspects of personality we require a design that allows measurement of the individual's momentary thoughts, feeling and behaviours, and the variation in these states over time and situations. Experience sampling is a methodology that allows frequent sampling in a natural context without being too intrusive. This method has begun to be used in organisational research (e.g., Miner, Glomb, & Miner, 2005) as it allows for short, frequent measures of feelings, thoughts and behaviours that occur across the workday. By assessing these states as they occur, ESM designs have been argued to be more ecologically valid and less prone to the biases in recall that affect retrospective reports of behaviour (e.g., Fisher, 2002). ESM is typically implemented by sending individuals signals (e.g., via handheld computers or email) at different times during the day over several weeks that request them to report on properties of the situation and their thoughts, feelings and behaviours at that point in time. The sampling design for the timing of the signals and the measures will depend on the specific hypotheses researchers are testing.

Hierarchical Linear Modelling

Integrating within-person and between-person variability raises several data-analytic complications that are not present in studies that focus solely on between-person differences (see Hofmann, 1997). In particular, the nested structure of the data (observations are clustered within individuals) creates dependency among the observations that violates the independence of observations assumption associated with the traditional ordinary least squares (OLS) analysis. Consequently, use of OLS to analyse multilevel data results in inaccurate (downwardly biased) estimates of standard error. In contrast, hierarchical linear modelling (HLM) explicitly and simultaneously models each level of analysis—including the residuals at each level—in terms of its own submodel. In this way, HLM accounts for the interdependence between observations that are clustered within individuals. Furthermore, it allows one to disentangle between-person and within-person effects on the outcome of interest, and to examine cross-level interactions.

Use of hierarchical linear modelling has been limited in the past due to the practical difficulties associated with estimating the model parameters, however the emergence of several statistical programs for accomplishing this purpose has resulted in an increased use of such models over the past decade (see Raudenbush & Bryk, 2002). Within-person relationships (e.g., between situations and states) can be modelled by parameters at level 1 and between-person relationships (e.g., between traits and mean states) can be modelled by parameters at level 2. Furthermore, cross-level interactions (e.g., the effects of traits on within-person situation-state relationships) can also be represented and tested by parameters at the second level.

QUESTIONS WITHIN AN INTEGRATED APPROACH

An integrated approach to studying personality at work lends itself to several types of questions that include but also go beyond the between-person questions that have typically been addressed in studies of personality at work (see Nezlek, 2007). In this section we outline and elaborate on these questions and provide illustrative examples from the literature.

- *Between-person relationships: Individuals differ systematically in their typical levels of cognitive, affective and behavioural states as a function of traits*

Between-person relationships are the typical types of relationships that have been examined in studies on personality at work. They include findings from meta-analyses in which the association between personality variables and cross-sectionally assessed outcomes of interest, such as job performance and job satisfaction, are estimated (e.g., Barrick & Mount, 1991; Judge, Heller, & Mount, 2002). This category also includes studies in which between-person differences in personality dispositions are related to between-person differences in aggregated levels of momentary states, such as positive and negative affect (e.g., Fisher, 2002).

- *Within-person relationships: An individual's states vary systematically as a function of the nominal and psychological properties of different situations as well as a function of other states*

In recent years, within-person relationships have received increasing attention in the organisational literature, although this body of research has primarily focused on state constructs that are distinct from personality, such as task performance (Fisher & Noble, 2004), job satisfaction (Ilies & Judge, 2002) and organisational citizenship behaviour (Ilies, Scott, & Judge, 2006). These studies indicate that within-person variability typically accounts for a substantial amount of the total variability in the construct of interest. Moreover, this variability is explicable as a function of momentary situational characteristics such as task difficulty (Fisher & Noble, 2004), as well as affective states (Ilies & Judge, 2002). In a recent study, we examined whether these findings extend to momentary variations in the conscientiousness levels of managers during three working weeks (Minbashian, Wood, & Beckmann, 2009, in press). As argued by Fleeson (2001), this represents a strong test of the viability of studying within-person aspects of

personality given the assumptions of cross-situational consistency traditionally associated with the FFM. Nevertheless, we found that within-person variability in conscientiousness was approximately two times greater than between-person difference in conscientiousness, and that psychological properties of the tasks individuals were engaged in (importance, difficulty, urgency) accounted for the majority of this variance.

- *Cross-level interactions: The within-person relationship between situations and states or between states and states, respectively, vary as a function of differences between people in traits*

In studies of within-person relationships the magnitude and/or direction of within-person effects frequently differ between people. These individual differences are often outcomes of interest in their own right and can be modelled as a function of personality traits and other individual difference variables, thus defining a third type of question that arises within an integrated approach. For example, Illies et al. (2006) found significant differences between people in the extent to which momentary positive affect was associated with organisational citizenship behaviour (OCB). This effect was moderated by agreeableness such that individuals low on agreeableness tended to display a strong association between positive affect and OCB, whereas highly agreeable individuals tended to display high levels of OCB regardless of their affect levels. In contrast, Illies and Judge (2002) found that individual differences in the within-person association between affect and momentary reports of job satisfaction were not significantly accounted for by either extraversion or neuroticism, although the latter was related to within-person variability in negative affect and job satisfaction. Such findings help to shed light on the way in which the effects of traits are reflected in everyday work situations.

- *Comparisons of relationships at different levels: The between-person relationship between two constructs is not necessarily equivalent to the within-person relationship between the constructs*

Findings from studies implementing between-person designs do not necessarily generalise to within-person phenomena. For instance, the between-person finding of a five-factor model of personality does not imply the existence of a five-factor structure that operates within most individuals. This is because, statistically, models of between-person variability are not related to models of within-person variability (Nezlek, 2001; Schmitz, 2006). While the distinctness of the two models has been discussed in the literature (e.g., Cervone, 2005, see also lead paper by Cervone, et al., 2006 and associated commentaries), there has been little systematic empirical investigation of this issue (Borsboom, Mellenbergh, & van Heerden, 2003). Few studies have directly compared findings with regard to the structure of personality at the between-person level with findings at the within-person level. In one study Borkenau and Ostendorf (1998) collected data from 22 students once a day over 90 consecutive days employing a German adjective-based FFM measure. Individual within-person factor structures of FFM relevant states were rather weakly related to the overall between-person reference factor structure of FFM traits as assessed in a different sample. A stronger match, however, was found when the average within-person factor structure was considered. In our own research we have looked at the relationship between two FFM dimensions, neuroticism and conscientiousness, from a between-person and a within-person perspective (Beckmann, Minbashian, & Wood, 2009, in press). We found that while neuroticism and conscientiousness were negatively related at the between-person level (a finding that is well documented in the literature, see Mount, Barrick, Scullen and Rounds, 2005), at the level of the individual this relationship was reversed. Further empirical evidence for the distinctness of within- and the between-person effects can be found in other areas of psychology, for instance, in the field of self-regulation (Vancouver, 2001, 2006).

CONCLUSION

Personality has increasingly become an important topic in organisational psychology. Much of this research has relied on between-person comparisons. In this chapter we argued that the field would benefit from an approach that incorporates within-person aspects of personality. We have presented a framework

that illustrates the types of research questions that can follow from this integrated approach. Furthermore we outlined some initial studies that fall within each type of research question. In the following paragraphs we list three areas of future research:

- *Broader focus.* More research is required to evaluate within- versus between-person effects on a broader range of personality related constructs. To date, most of the research has focused on a limited number of broad personality dimensions, such as conscientiousness and neuroticism (Minbashian, et al., 2009; Beckmann et al., 2009). Yet, the personality domain comprises a multitude of constructs, both broad and narrow that are likely to be relevant for a work context, such as openness to experience (Barrick, et al., 2001), or goal orientation (Payne et al., 2007).
- *Conceptual clarity.* Research is required to provide theoretical clarity about the types of effects studied at the within- and between-person levels. Questions of interests include: a) whether within-person effects (e.g., situation-state contingencies, such as an individual's responsiveness to situational cues) are stable across macro-contexts; b) whether these within-person effects are assessing constructs that are distinct from traditional trait constructs (rather than representing different methods of assessing the same constructs), and if so; c) how they fit in the nomological net of the traditional trait constructs.
- *Malleability.* Traditionally, trait approaches to personality have focused on the stable aspects of personality and, consequently, there have been few applications designed to develop personality in a way that facilitates performance in work contexts. It is likely that within-person aspects of personality are more modifiable. Unlike trait measures that have been traditionally rooted in biology, within-person effects are thought to reflect cognitive factors that arguable are more amenable to intervention (Mischel & Shoda, 1995). However, this is an empirical question that has received little attention to date in the organisational literature.
- *Implications for work outcomes.* Finally, studies are required to evaluate the implications of within-person effects for predicting and explaining work outcomes. In particular, from a practical perspective an important question relates to whether within-person measures provide incremental validity over what is already accounted for by traditional trait measures. Furthermore, a study that addresses this issue can also provide insight into the day-to-day processes by which personality traits influence important work outcomes; that is, one can explore the extent to which within-person constructs mediate the trait-job performance relationships that have traditionally been observed. This knowledge is relevant for organisational psychologists who are interested in identifying the underlying psychological processes that can be targeted as part of employee learning and development programs in order to implement behavioural change.

Integrating within- and between-person variability into the study of personality at work represents an exciting direction for future research. Pursuing this approach will lead to a more comprehensive picture of the individual in their work environment than captured by a purely between-person trait perspective.

REFERENCES

- Barrick, M. R. & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44, 1-26.
- Barrick, M. R. & Mount, M. K. (1993). Autonomy as a moderator of the relationships between the Big Five personality dimensions and job performance. *Journal of Applied Psychology*, 78, 111-118.
- Barrick, M. R. & Mount, M. K. (2005). Yes, personality matters: Moving on to more important matters. *Human Performance*, 18, 359-372.
- Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment*, 9, 9-30.

- Beckmann, N., Wood, R.E., & Minbashian, A. (in press). It depends how you look at it: On the relationship between conscientiousness and neuroticism at the within- and between-person levels of analysis. *Journal of Research in Personality*
- Beckmann, N., Wood, R.E., & Minbashian, A. (2009, 25-28 November). *It depends how you look at it—on the relationship between conscientiousness and neuroticism*. Paper presented at the 8th Australian Conference on Personality and Individual Differences, Sydney, Australia.
- Borkenau, P. & Ostendorf, F. (1998). The Big Five states: How useful is the Five-Factor Model to describe intraindividual variation over time? *Journal of Research in Personality*, 32, 202-221.
- Borkenau, P., Egloff, B., Eid, M., Henning, J., Kersting, M., Neubauer, A. C., & Spinath, F. M. (2005). Persönlichkeitspsychologie: Stand und Perspektiven [Personality psychology: Current state and future prospects]. *Psychologische Rundschau*, 56, 271-290.
- Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2003). The theoretical status of latent variables. *Psychological Review*, 110, 203-219.
- Cervone, D. (2005). Personality Architecture: Within-person structures and processes. *Annual Review of Psychology*, 56, 423-452.
- Cervone, D. (2004). The architecture of personality. *Psychological Review*, 111, 183-204.
- Cervone, D., Shadel, W. G., Smith, R.E., & Fiori, M. (2006). Self-regulation: Suggestions and reminders from personality science. *Applied Psychology: An International Review*, 55, 333-385.
- Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) manual*. Odessa, FL: Psychological Assessment Resources.
- Feldman Barrett, L. & Barrett, D. J. (2001). An introduction to computerized experience sampling in psychology. *Social Science Computer Review*, 19, 175-185.
- Fisher, C. & Noble, Ch. S. (2004). A within-person examination of correlates of performance and emotions while working. *Human Performance*, 17, 145-168.
- Fisher, C. D. (2002). Antecedents and consequences of real-time affective reactions at work. *Motivation and Emotion*, 26, 3-30.
- Fleeson, W. & Jolley, S. (2006). The challenge and the opportunity of intraindividual variability: A theory of human flexibility. In D. Mroczek & T. D. Little (Eds.). *Handbook of personality development* (pp.41-60). Mahwah, NJ: Lawrence Erlbaum.
- Fleeson, W. (2001). Towards a structure- and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality and Social Psychology*, 80, 1011-1027.
- Hofmann, D. A. (1997). An overview of the logic and rationale of hierarchical linear models. *Journal of Management*, 23, 723-744.
- Ilies R. & Judge, T. A. (2002). Understanding the dynamic relationships among personality, mood, and job satisfaction: A field experience sampling study, *Organizational Behavior and Human Decision Processes*, 89, 1119-1139.
- Ilies, R., Scott, B. A., & Judge, T. A. (2006). The interactive effects of personal traits and experienced states on intraindividual patterns of citizenship behavior. *Academy of Management Journal*, 49, 561-575.
- Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-Factor Model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, 87, 530-541.
- Matthews, G. & Deary, I. J. (1998). *Personality traits*. Cambridge, UK: Cambridge University Press.
- McCrae R. R. & Costa P. T., Jr. (1999). A Five-Factor Theory of personality. In L. A. Pervin and O.P. John (Eds.), *Handbook of personality psychology* (pp.139-155). New York: Guilford.
- Minbashian, A., Wood, R. E., & Beckmann, N. (in press). Task-contingent conscientiousness as a unit of personality at work. *Journal of Applied Psychology*
- Minbashian, A., Wood, R. E., & Beckmann, N. (2009). *Contingent beliefs as predictors of within-person variation in conscientiousness at work*. In George T. Solomon (Ed.), *Proceedings of the Sixty-Sixth Annual Meeting of the Academy of Management* (CD), ISSN 1543-8643.
- Miner, A. G., Glomb, T. M., & Hulin, C. (2005). Experience sampling mood and its correlates at work. *Journal of Occupational and Organizational Psychology*, 78, 171-193.

- Mischel, W. & Shoda, Y. (1995). A cognitive–affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102, 246-268.
- Mischel, W. (1973). Toward a cognitive social reconceptualization of personality. *Psychological Review*, 80, 252-283.
- Mount, M. K., Barrick, M. R., Scullen, S. M., & Rounds, J. (2005). Higher-order dimension of the Big Five personality traits and the Big Six vocational interest types. *Personnel Psychology*, 58, 447-478.
- Nezlek, J.B. (2001). Multilevel random coefficient analyses of event- and interval-contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin*, 27, 771-785.
- Nezlek, J. B. (2007). A multilevel framework for understanding relationships among traits, states, situations and behaviours. *European Journal of Personality*, 21, 789-810.
- Payne, S. C., Youngcourt, S. S., & Beaubien, J. M. (2007). A meta-analytic examination of the goal orientation nomological net. *Journal of Applied Psychology*, 92, 128-150.
- Raudenbush, S.W., & Bryk, A. S. (2002). *Hierarchical linear models (2nd ed.)*. Newbury Park, CA: Sage Publications.
- Schmitz, B. (2006). Advantages of studying processes in educational research. *Learning and Instruction*, 16, 433-449.
- Vancouver, J. B., Thompson, Ch. M., & Williams, A. A. (2001). The changing signs in the relationships among self-efficacy, personal goals, and performance. *Journal of Applied Psychology*, 86, 605-620.
- Vancouver, J. B. & Kendall, L. N. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal of Applied Psychology*, 91, 1146-1153.